

BIBLICAL CREATION

JOURNAL OF THE BIBLICAL CREATION SOCIETY

4:13



COLLECTING UNDER BYNG CLIFF

Editorial: Creation, Humanity and God's Word	67
News Items	68
Creationism in Germany <i>by J.H. John Peet</i>	69
Let God Be True <i>by Mike G. Matthews</i>	71
Correspondence	74
Philip Henry Gosse, 1810-1888 <i>by David L. Pott</i>	75
Thinking Again About Adam <i>by Bruce F. Baker</i>	84
Creationism Defended: A Review Article <i>by Christoph Bluth</i>	88
Book Review	101

Editorial Committee

David C. Watts, PhD, BSc, MInstP, CChem, FRSC, General Editor,
Lecturer in Materials Science, University of Manchester,
Visiting Associate Professor of Biological Materials,
Northwestern University, Chicago.

The Revd Nigel M. de S. Cameron, MA, BD, PhD,
Warden of Rutherford House, Edinburgh.

J.H. John Peet, PhD, CChem, FRSC,
Science Coordinator at Guildford County College of Technology.

The Revd John C. Sharp, BSc, BD, PhD,
Minister of the South Parish Church, East Kilbride.

David J. Tyler, MSc, MInstP, ACFl,
Lecturer at Manchester Polytechnic.

EDITORIAL

Creation, Humanity and God's Word

For several decades now there has been intense academic interest in the *diversity* of human cultures. This emphasis originated in the secular disciplines of sociology and cultural anthropology. It has radically influenced the academic study of the Bible, enhancing our awareness of the ancient milieu of the 'Biblical world' and also influencing the cross-cultural proclamation of the Gospel by the Church. Attention to the particular features of grammar and historical background has long been recognised as vital to accurate biblical interpretation. And Scripture itself also speaks of the spectrum of human culture — of nations, tribes, peoples and languages (Rev. 7:9). Nevertheless, this 'insight' has become so stressed that truth has suffered distortion. In the name of 'cultural distance and diversity' scholars have ridiculed the possibility of the ancient Scriptures being an authentic and relevant Word to our generation. How could Jesus Christ's own understanding escape being moulded by the limited horizons of Jewish society in the first century? And how could Paul, a Hellenistic Jew who had received a Pharisaical education, speak absolute truth in a transient Greek language? In many such ways the 'modern mind' sits in judgement upon Holy Writ. Becoming a Christian entails turning from precisely such proud autonomous individualism to submit our hearts and minds to the Christ of Scripture.

On the authority of this Christ we learn that the basic reality of mankind lies in the *unity* of the human race as descendants of Adam, with our universal unwillingness to acknowledge the claims of God our Maker. Man's problem in hearing the voice of the Lord God is not cultural distance but a sinful heart. When Jesus Christ, the eternal Word, was made flesh he could speak — with his human tongue — words that came from heaven and revealed the Father to us. His speech was out of tune with the views of first century Palestinian society. People understood very well his claims to deity and shouted "Crucify him!" Yet his servant Paul told the Corinthians that God gave his wisdom to those whose hearts he opened: "but not the wisdom of this age or of the rulers of this age, who are coming to nothing. No, we speak of God's secret wisdom, a wisdom that has been hidden and that God destined for our glory before time began. None of the rulers of this age understood it, for if they had they would not have crucified the Lord of glory." (I Cor. 2:6-8).

The radical cultural division now lies between the new humanity 'in Christ' and the remaining sinful humanity 'in Adam'. There is an unseen warfare raging — as Augustine recognised — between the city of God and the city of the world. There is much that is valuable and true in modern knowledge, for which the Christian gives thanks to God. But the dimensions of this warfare also involve the world of scholarship, despite claims to absolute neutrality. Tertullian's question deserves careful pondering: "What indeed has Athens to

do with Jerusalem?" Let us not therefore dismiss the Biblical witness to man's creation and subsequent fall as irrelevant to the Gospel. These truths are vital to a Christian understanding of God, man, revelation and redemption. Neither let us carelessly synthesize the transient wisdom of this age with the enduring heavenly wisdom.

David Watts

Contributors to this issue

Bruce Baker is the Minister at Mottram Congregational Church, Greater Manchester.

Christoph Bluth studied Physics and Mathematics at Trinity College, Dublin. He is the author of "Der Ursprung des Menschen" (Berlin, 1972) and a study on "The Thermodynamics of Biological Evolution" available through BCS. He is a member of a Christian Community in Dublin, the Irish Mennonite Movement.

M.G. Matthews is a mature student reading Architecture at Newcastle University.

David Pott is the Senior Teacher at Trinity Christian School, Hyde, Cheshire.

NEWS ITEMS

North East Conference on Biblical Creation

A day conference on Biblical Creation as it relates to the current Creation/Evolution debate has been arranged for Saturday 19th March. The venue is to be Rickleton Chapel which is situated just off the A1 (M) 7 miles south of Newcastle-upon-Tyne within easy travelling distance of the Tyneside and Teeside areas. The principal aim of the conference is to deal with the problems faced by school teachers and parents in giving a coherent answer to the questions raised by the dogmatic teaching of evolution. The conference will also no doubt be of interest to others who find the need to think through their Biblical faith in the face of the challenge from secularism. The speakers will be David Pott, Gordon Keddie, Sylvia Baker, and David Tyler. A buffet lunch will be provided at a small charge. Further details and a booking form can be obtained from — D.S. Walton, 103 Cromarty, Ouston, Chester-le-Street, Co. Durham, DH2 1JU. Tel. Birtley (0632) 402997.

The BCS Field Study Week for young people

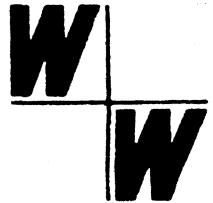
The study week proposed in BC12 has now been arranged and will take place at the Withycombe Barton Christian Field Study Centre, Exmouth, Devon from 2nd April — 9th April, 1983. The cost will be £38 per person. An exciting opportunity not to be missed! For further details write to David Tyler, 24 Harrow Road, Brooklands, Sale, Cheshire, M33 3TL.

CREATIONISM IN GERMANY

J.H. John Peet

The Creationist movement in Germany is younger and smaller than that in Britain but certainly no less vigorous or productive. During a holiday trip to Germany, it was my pleasure to meet Professor Hermann Schneider, one of the leading Creationists in that country. Our hearts were warmed by the generous hospitality and good fellowship of our brother. Professor Schneider is professor of High Energy Physics at the University of Heidelberg. He has written papers of geochronology and the "Big Bang" theory, amongst other topics.

The creationist movement of Germany is best known through its publishing arm "Wort und Wissen" (Word and Knowledge). The title is short for "Gottes Wort und Wissenschaft" (God's Word and Scientific Knowledge). Their symbol shows the two W's and a central Cross.



Formed about ten years ago, the organisation has approximately seventy members and a strong steering committee which includes six professors. A number of others serve on their advisory panel. Though not totally devoid of theologians, in contrast to its British counterpart it is weakly represented in this field. The inevitable result of the German theological scene! One of the committee, Herr Friedrich Hanssler, is a publisher and he has used his expertise to facilitate the publication of some excellent paperbacks. We, in Britain, must try to emulate this standard. One, for example, be Dr. Joachim Scheven is on the fossil record. It is 130 pages long and contains over 100 coloured photographs. It would not look out of place in any bookshop. The cost is just over £3! Thirteen books have been published in this series. Creationists articles are usually carried in the magazine "Factum," which covers a wider spectrum of material than just the creationist matter.

Dr. Scheven, whose book was mentioned above, has established himself as an able research worker in the creationist cause. His theory on coal formation (published in English in "Biblical Creation" no. 9) has been tried and tested in public debate. It is far superior to the gradualistic theory which leaves many observations unanswered.

A museum is being set up in the centre of Germany at Hagen and Dr. Scheven will be its director. It is being built around his considerable fossil material and should be well worth a visit by anyone visiting that country. Also highly commendable is the ability of our German colleagues to organise academic

symposia and publish papers in journals on matters relevant to the creationist position. For example, in 1981, Professor Werner Gitt organised a meeting of the Physikalische Technische Bundesanstalt at Braunschweig to examine "Structure and Information in Technology and Nature." Nine papers were presented. Not all the papers were by creationists, but their significance was increased as a result. The symposium has been published.

One paper at this symposium was by Professor Vollmert on "Conditions for the Formation of Macromolecules." He is the author of a widely acclaimed academic book on Macromolecular Chemistry. When he rewrote the work, he decided to include a section on macromolecules in biology. As recounted to me by Prof. Schneider, the result was that Prof. Vollmert found that evolutionary models were seriously deficient at this point. He discusses this in his book. However, the publishers did not want this portion included and insisted it be removed. Prof. Vollmert declined and published the book himself. The publishers sacrificed a good seller because they could not accept this honest position.

British Creationists will applaud the outstanding work of their German counterparts and I append some relevant addresses for any who wish to follow this up. One other piece of news received during my visit concerns Dr. Robert V. Gentry of the U.S.A. Dr. Gentry has carried out very significant research into the existence of "radiohalos" in the rocks. These are spherical rock discolourations of microscopic size, caused by radiation. His results, all of which have been published in leading scientific journals (such as *Nature* and *Science*), have been a problem for the uniformitarian. Apparently, in spite of the prestige of his work, his contract with his employers has not been renewed. This is very unusual and it is feared that this may be a result of his known creationist position. However, I must add that I have not had the reason for his dismissal confirmed. The Creation Science Movement reports a similar fate for Dr. Jerry Bergmann who lost his job, partly because of his publication of a booklet in favour of Creation. It still costs to stand in line with God's Word!

Useful addresses:

1. Publications: Studiengemeinschaft Wort und Wissen e. V., Zum Berger See 91, D-5820 Gevelsberg, Germany.
2. Museum: Lebendige Vorwelt, D-5800 Hagen 5-Hohenlimburg, Unterm Hagen 22A, Germany.
3. Magazine: Förderung christlicher Publizistik, Postfach 263, CH-9435 Heerbrugg, Switzerland.

LET GOD BE TRUE

M.G. Matthews

Let God be true — and every scientist a liar! Extreme reactionism? Maybe, but if it came to such a conflict, would we weaken? There is one celebrated case which has recently received attention on B.B.C. Radio 4¹, which should serve to remind us of the depths of deception in the unregenerate heart, and drive us afresh to the *only* absolute source of truth — the revealed, inscripturated Word of God.

Sir Cyril Burt was Professor of Psychology at University College, London, from 1931 to 1950. He was highly respected and influential, until after his death in 1971; even Margaret Thatcher (when Secretary of State for Education) was said to have been anxious to know his opinions on certain education issues. His influence in the world of education, direct and indirect, has been great, as the structure of state schooling embodied in the 1944 Education Act owed much to his theories concerning I.Q. Grammar, Technical and secondary modern schools were created for children of different 'innate' abilities, following Burt's insistence that I.Q. was inherited.

But after almost 40 years of unquestioned authority, Burt was discovered to be a liar and a fraud of monumental proportions.² The research upon which his theories were based was shown to be totally fabricated. The assistants which had supposedly assisted him, whose names appeared alongside his publications, did not exist. In addition he mounted attacks on his opponents by writing under the names of some of his own students or colleagues — which made them even consider taking him to court.

Even more illuminating, however, were the comments of fellow scientists when the fraud was discovered. World-renowned psychologist Hans Eysenck rushed to his defence, as did Professor John Cohen of Manchester University, and many others. The exposers of the fraud were confronted with all kinds of intellectual intimidation from the scientific establishment. Commenting later, Professor Leon Kamin observed that 'trust' is an important element in science and 'few people examine the original sources'. Apparently at the time 'people doubted, but wouldn't say' — 'they would not 'think the unthinkable', they had too high a regard for the man himself.'³

What relevance, what lessons, has this for us in the field of biblical creation and education?

Firstly, we are often confronted with the theories of social and educational psychologists as though they were fact. This can be unnerving for those who know nothing of these matters; it is difficult to argue against what is presented as 'proven fact'. This case, however, shows that the reliability of such theories is very much in question. This is not to say that all scientists in the field are frauds, but if it can happen once, it can happen again. In addition, the whole subject is hardly amenable to scientific analysis in any event: "In the search for 'reliable knowledge' concerning human behaviour we thus arrive at a rather disappointing conclusion . . . The conjectural models, the conceptual schemes, the hidden variables, that are postulated, in perfect good faith, by social scientists have not received consensual status, and do not constitute a working theoretical basis for social action". (John Ziman, *Reliable Knowledge*) This writer discounts the 'old ideas' of revealed truth, but acknowledges the problems left if one dispenses with them!

Secondly, the case of Burt illustrates most powerfully the effect of sinful human nature on any scientific endeavour. Scientists are human beings — they all have their prejudices, (even Christian scientists!) though few would be consciously deceiving as Burt. The impossibility of totally impartial observation must be understood — even Ziman (op. cit.) recognises this fact. But the reaction of Burt's colleagues shows that they too were often more influenced by their own personal affiliations than by a regard for truth!

Thirdly, taken together with other well-known cases of scientific fraud, such as Piltdown Man (very likely the creation of arch-evolution Teilhard de Chardin⁴), it should make us very wary of accepting 'proven scientific facts', **especially** where they appear to conflict with biblical teaching. Both scientists and public will soon accept what they *want* to believe without too many questions, and a vast fabric can be built on an unproven foundation,⁵ a fabric which then becomes self-vindicating and self-supporting. If it is true that few scientific popularizers examine original sources, then those that glibly quote radio-isotope dates for fossils can rightly be questioned!

Of course, for many Christians we do not need such 'evidence' to bolster our faith or our position. We have God's own judgement and wisdom on these matters, and our scientific and pedagogical principles are derived therefrom. In the light of the foregoing it would be the height of folly to derive them from human wisdom! However, such facts as we have in this case are invaluable in our contending with unbelievers; and it also sadly has to be said that too many Christians, even those of some eminence, have too high a regard for the 'scientist' and his endeavours, as though his calling cuts him off from the fall in Adam, at least as far as his 'science' is concerned. For those evangelicals, who will not support the 'unscientific', and 'unacademic' creationist position because of the so-called 'proven facts' of science, let this serve as a salutary lesson. Let God be true — and every man a liar!

Footnotes:

1. 'The Burt Scandal', B.B.C. Radio 4, Thursday 29th April, 1982.
2. 'A superbly successful confidence trickster' Oliver Gillie, in Radio Times 24-30th April, 1982.
3. 'Not one of the many psychologists who had grave reservations about Burt's trustworthiness found a way to make their doubts public; nobody it seems ever bothered to read Burt's papers . . . ' Martin Goldman, in Radio Times 22-28th May, 1982.
4. See 'Ape-Man — Fact or Fallacy?' M. Bowden.
5. 'Burt's lies, accepted as they were in the corridors of power, did widespread damage to many young lives. We psychologists must hang our heads in shame at our own careless gullibility . . . ' Mrs A.D. Lewis, letter in Radio Times 22-28th May, 1982. (If one man's lies have done damage, how sad that the destruction wrought by evolutionary theory cannot be seen for what it is!)

CORRESPONDENCE

Dear Sir

Review of "The neck of the Giraffe"

I was interested to read Dr. David Watts' review of Francis Hitchin's book in Biblical Creation July 1982. May I be permitted to voice my own view of this publication?

Hitchin is first and foremost a popular author having written works with such titles as "World Atlas of Mysteries" and "Earth Magic". He appears to realise that a subject as controversial as creation vs evolution would generate widespread interest. He has therefore culled his information from the creationist literature which is freely available to any who require it with little effort needed in research. He has 'lifted' several passages direct from my own book "Ape-Men — Fact or Fallacy?" and redrawn three of my pictures of Pekin 'woman' to avoid copyright — all without acknowledgement of his source.

Hitchin's book is largely an exposition of the creationists viewpoint from the beginning to almost the end. It is only in the last few chapters that he implies that the theory of evolution will nevertheless survive.

What I found most surprising — yet not altogether unexpected — was his almost complete silence regarding the Piltdown Fraud. He had read my book and knew that the Piltdown fraud was far more devious than generally acknowledged.

The book which eventually appeared on the market was noticeably different to that which I was expecting. At the end of a meeting which I addressed on "Ape-Men frauds" he approached me and assured me that he was very interested in my book. He promised to visit me as he was in the course of writing a similar work which was to be entitled "The Darwinian Conspiracy". His published work is far from being so controversial as his original title implies, and one is left wondering what made him change his mind.

Yours sincerely,

Malcolm Bowden

Dear Dr. Watts

I am writing in the hope that, through the pages of the Biblical Creation Society Journal, I may be able to appeal for help.

Focus Trust is an Evangelical Christian group, making taped radio programmes which are broadcast in many parts of the world, especially developing countries.

One of our main series is a scientific news programme with a Christian message, called "World of Science". This has been very widely used:- the last series was broadcast about a thousand times, on seven different stations, and we received hundreds of letters in response to it. We are now embarking on a new series of "World of Science", and our biggest problem is to find several new scientifically trained Evangelical Christians, who will write short scripts (primarily news reports) on a regular basis. I am wondering whether any of your readers would be willing to become involved in this strategic work?

I shall be very glad if anyone who is interested in helping will write to me, at the above address.

Yours in Christian service

David Couchman

PHILIP HENRY GOSSE — (1810-1888)

David Pott

Christians in the latter part of the twentieth century are fortunate to live in a time when there are available many good books, showing the trustworthiness and reliability of the Bible, and showing conversely the inadequacies of a higher critical approach to Scripture. In particular, we also benefit from the work of Christian theologians and scientists who show us that we can hold firmly to the historicity of Genesis 1-11 without committing intellectual suicide. How would we have fared in the intellectual ferment of 100 to 150 years ago? We may perhaps be able to answer this question by looking at the life of one Christian who had to face those whose views challenged the very foundations of his beliefs.

Philip Gosse is best known through the fascinating book by his son Edmund, "Father and Son, a Study of Two Temperaments". Christians who read this account will find much that is valuable, but it also leaves many unanswered questions, and also a strong suspicion that in places Edmund is seeking to justify his own departure from a Christian upbringing. Some valuable research by Douglas Wertheimer¹ in an unpublished thesis has shown that the situation between Edmund and his father was not quite as he portrayed it, and this is why a reappraisal of Philip Gosse is so necessary.

Philip was born in Worcester in 1810, significantly only a year after the birth of Charles Darwin. His father was an artist, a skill which Philip also possessed. At an early age he showed some interest in natural history, and this was encouraged by his parents who made sure that encyclopedias on natural history were available to him. He was given many travel books, and also "Robinson Crusoe" and "Pilgrim's Progress". The latter he learnt by heart when he was only ten years of age. He left school in 1825, and became a clerk at a mercantile house involved in the Newfoundland trade, and in the spring of 1827, he went, reluctantly, to Newfoundland itself, where he was to live for seven years.

The year 1832 was a turning point in Gosse's life. First of all he yielded himself unreservedly to God. His mother had always encouraged him to read his Bible and seek after God, but up until this time, Gosse had always respected the gospel from the outside rather than partaking of its blessings for himself. But at this time in his own words "I wanted the Almighty to be my friend: to go to Him in my need. I knew He required me to be holy. The Lord had said "My son give me thy heart." I closed with him . . . intending henceforth to live a new, a holy life, to please and serve God."² But this was also the year that he began to be a naturalist in earnest. Previously the natural world had interested him, but it seems that simultaneously with his conversion, God opened up to him the fact that his life would be greatly concerned with setting forth the wonders of God's

Biblical Creation 4:13

works in creation. In 1835, Gosse went to southern Canada, where he lived for three years. This was a difficult time for Gosse, but was very beneficial for his development as a naturalist. From 1838-9, he lived in various places in the U.S.A. and the rolling stone eventually returned to England in January 1839.

His initial intention was to become a minister within the Methodist church, but he soon became disillusioned with Methodism in general. Gradually the shillings slipped away, and it was in a state of some desperation that he took a manuscript about his experience as a naturalist in Canada to the publisher Mr Jan van Voorst. When Mr Voorst offered him one hundred guineas for it, he was so surprised that he broke down and sobbed uncontrollably. The book was an immediate success being praised for its "unacademic freshness". The next few years were spent in London fitting himself to compete in scientific matters on equal terms with men who had had a head start on him. Much of his time was spent at the British Museum. He also at this time joined the Brethren, and became very absorbed in matters of prophecy. He began to pray a prayer which he continued for the rest of his life that he would be "one of the favoured saints who shall never taste of death, but be alive and remain until the coming of the Lord."³ In 1843, he found a new publisher in the S.P.C.K. who published his "Introduction to Zoology".

From 1844 until 1846 Gosse was in Jamaica on behalf of the British Museum. In 1847 he met Emily Bowes, and they married a year later. Their only child Edmund was born in 1849. Writing was now Gosse's full-time career and the next twelve years saw a constant flow of books.

Hard work, and his failure to take any holidays whatsoever resulted in his being violently ill with nervous dyspepsia, and this led to the move to South Devon in 1852. Apart from some winters in London, a year at Weymouth and several lecture tours, Devon was to be Gosse's home for the rest of his life, and it was on these coasts that he did his most valuable work as a pioneer of the science of marine biology. In the midst of this period of prolific writing, Emily died in 1857. Edmund was always impressed with the way that his parents faced her final illness and death "with extraordinary tranquillity and serene and sensible resignation. There was no rebellion, no repining . . . even an atheist might admit that the overpowering miracle of grace was mightily efficient".⁴ Philip remarried some four years later, and Eliza proved to be a very courageous wife in often trying circumstances. The flow of writing came to an abrupt close in the 60's for reasons which will become apparent later in this essay, but during the final decade of his life, he returned to the pursuit of natural history with the same vigour and enthusiasm which characterised his earlier years. It should be borne in mind that for Gosse the work of preaching the gospel was of first importance. In the late 1850's, he attached himself to an independent fellowship and he soon assumed the administration of it.

Under his leadership, the cause flourished, and he was a forthright preacher

Pott: Philip Henry Gosse

and a faithful pastor to his flock. He called the fellowship simply "The Church of Christ in the Parish of St. Marychurch".⁵

He died on August 23rd 1888, and some years later Eliza commented that "the hope of being caught up before death continued to the last, and its non-fulfilment was an acute disappointment to him. It undoubtedly was connected with the deep dejection of his latest hours on earth."⁶

.....

Gosse was a patient and accurate investigator of many different aspects of the natural world. He referred to himself as a "hewer of wood and a drawer of water in the house of science"⁷ and this compliments T.H. Huxley's description of him as "that honest hodsman of science".⁸ The illustrations in his notebooks clearly show his close attention to detail. Entomology was his first interest in Newfoundland, and in one year there (1833) he recorded no fewer than 388 species. It was to insects that he returned in the last years of his life. His collection of lepidoptera was somewhere in the region of 2,500 specimens in the 1880's. While on the island of Jamaica, he recorded 200 species of birds, and he also added 24 species of hitherto unknown mammals, fish and reptiles to science. He also kept a very comprehensive collection of orchids in his greenhouse at his home in St. Marychurch. So then there was virtually no aspect of natural history which did not come under Gosse's investigation at some time in his life, but as has already been mentioned it was his skill in the area of marine biology which won him lasting fame.

In the rock pools of Devon Gosse "conducted himself like an explorer in darkest Africa. In truth that is what he was"⁹, for this was scientific 'terra incognita' in the 1850's. He added 34 species of sea anenomes to the British list. His own particular favourites were the rotifera or animalcules — the tiny creatures (living in both salt and fresh water) which are often "no bigger than a fullstop". One of the earliest investigators of rotifera was a pastor from Danzig, Johann Eichorn who wrote in 1781 that he studied rotifera "in order to know God in his smallest and invisible works; and" he added "I have found Him very great therein."¹⁰ Gosse in collaboration with W.H. Hudson described 250 species of rotifera, 80 of which Gosse had discovered. Their findings were published in 1886 in a book which is still acknowledged as essential reading in its field.

In the contents page of his book "The Naturalists" (1978), Alan Jenkins writes that Gosse "believed implicitly in the Biblical version of the Creation. Yet he was a brilliant naturalist, particularly in the field of marine biology."¹¹ There is no justification for this implied surprise, because nearly all the great naturalists prior to Gosse had also believed in Creation. Men like Conrad Gesner, William Turner, John Ray, and Carl Linnaeus believed, like Gosse that they

were taking up the Adamic role in their patient investigation of God's world and in naming the different creatures in it.

The manner of Gosse's field work in the rock pools is beautifully described by Edmund in "Father and Son".

"The way in which my Father worked, in his most desperate escapades, was to wade breast-high into one of the huge pools, and examine the worm-eaten surface of the rock above and below the brim. In such remote places — spots where I could never venture, being left, a slightly timorous Andromeda, chained to a safer level of the cliff — in these extreme basins, there used often to lurk a marvellous profusion of animal and vegetable forms. My Father would search for the roughest and most corroded points of rock, those offering the best refuge for a variety of creatures, and would then chisel off fragments as low down in the water as he could. These pieces of rock were instantly plunged in the salt water of jars which we had brought with us for the purpose. When as much had been collected as we could carry away — my Father always dragged about an immense square basket, the creak of whose handles I can still fancy that I hear — we turned to trudge up the long climb home. Then all our prizes were spread out, face upward, in shallow pans of clean sea-water."¹²

In 1854, Gosse published a book entitled simply "The Aquarium" which was to have far reaching consequences. In it, he outlined the design of a "marine aquarium for the parlour or conservatory," and his suggestions came at a particularly propitious time when the penal tax on glass had just been abolished and at a time when more and more people were becoming interested in nature study. The book led to an outbreak of aquaromania in Britain, and indeed the first marine aquarium in Britain at Regent's Park Zoo was Gosse's brainchild. The principle of these aquariums was a simple one: Gosse noticed that while fish used up oxygen and replaced it with carbon dioxide, aquatic plants absorbed carbon dioxide and replaced it with oxygen. He thus concluded that marine animals and aquatic plants could live together in a tank indefinitely.

The fact that Gosse did not have an academic background partly accounts for his concern to share his discoveries with the layman. Edmund's assessment was that "he did more than all his scientific contemporaries to popularize the study of natural objects".¹³ One of the strengths of books like "Rambles on the Devonshire Coast" and "The Romance of Natural History" is that they positively sparkle with the author's evident enthusiasm for his subject. Furthermore they do not entirely satisfy the reader's curiosity — he feels he must go out and appreciate God's world for himself. We are familiar today with guide books to every branch of natural history, but few today realise that Gosse was a pioneer in this field also with

books like "Popular British Ornithology" (1849), and also guide books on Mammals and Fish. He enjoyed writing for children, and in 1845, S.P.C.K. published his "Glimpses of the Wonderful", a Christmas annual, the main argument of which was that there may be many great human achievements, but how much greater are God's works in creation. The only negative factor in this popularization, was that the rock pools were denuded by thousands of collectors, and by the end of Gosse's life, Edmund could write that "these pools no longer exist, they are all profaned, and emptied and vulgarised".¹⁴

.....

On 20th March, 1855, Gosse read a paper on a genus of sea anenomes before the Linnaean Society, and after the meeting, he was introduced to Charles Darwin. Gosse was "captivated at once by the simplicity, frankness and cordiality of this great and charming man".¹⁵ Some years later he described Darwin as "a perfectly dependable naturalist"¹⁶ and they maintained a good relationship throughout their lives. The correspondence between the two naturalists was mostly of a fairly technical nature and avoided anything which might jeopardize their mutual respect. The last book which Gosse ever read was a biography of Charles Darwin.

As Gosse became more well known during the 40's and 50's, he was very much aware of the fact that a growing number of biologists and geologists were claiming that the earth's organic features could best be understood by eliminating the supernatural factor, and seeking only naturalistic causes. It seems that Gosse felt the primary attack on a Biblical view was from geology, and he was probably disturbed by the growing number of evangelicals who followed the line of reasoning put forward by free churchmen north of the border such as Thomas Chalmers and Hugh Miller, who put forward the day-age theory. Gosse's book "Omphalos", published in 1857 was sub-titled "An Attempt to Untie the Geological Knot". The book was based on the idea of prochronism or the built-in theory. He argued that in the same way that the first created trees would have had tree rings, and that Adam would have had a navel and an apparent adult age at the moment of creation, even so it is quite logical to suggest that God created the earth with fossil skeletons already in its crust. However, it is very noticeable that Gosse approached the whole question in a philosophical and speculative rather than a scientific manner. Unfortunately it is also obvious that geology was not Gosse's sphere. It seems that Gosse had very high hopes for the book, so the negative response was a keen disappointment to him. Even his close friend Charles Kingsley called the work "desperate", and wrote to Gosse that "I cannot believe that God has written on the rocks one enormous and superfluous lie for all mankind".¹⁷

In spite of the welter of criticism, Gosse stuck rigidly to his guns. His reaction to the "Origin of Species" was that he conceded that there was some truth in it,

but that it completely trampled on revelation. Referring to the theory he exclaimed: "Coolly blowing aside God's authority this writer has hatched a scheme, by which the immediate ancestor of Adam was a chimpanzee, and his remote ancestor a maggot!"¹⁸

By the 1860's, Gosse was becoming rapidly disillusioned. He referred to "the rapid apostacy of science to infidelity"¹⁹ and claimed that although science itself is of course truth "it is becoming so overlaid and impenetrated with an impudent infidelity that the pursuit of it, in this age, had become exceedingly perilous".²⁰ This was the main reason for the sudden cessation of writing during the 60's. It was also at this time that he became a founding member and vice-president of the Victoria Institute, set up to combat the opposition of Science (falsely so-called) to the Scriptures.

It appears that Gosse realised in his later years that his silence was not the most helpful of reactions to the situation, and his work on butterflies was spurred on by the thought that he might find evidence against Darwin's theory. It is a great pity that Gosse wrote "Omphalos" when he did. It occurs to the present writer that he could (with his biological knowledge) have written a very effective response to the "Origin of Species" had he not already tarnished his reputation with "Omphalos".

.....

Christians in the 1980's face some problems not unlike those which Gosse encountered a century ago, and there are both negative and positive lessons that can be learnt from his life. Let us consider the negative lessons first.

In appreciation of her husband's life and work, Eliza Gosse included these significant words from an obituary in "The Christian". "Gosse's impulsive eager spirit combined with the warmth of his imagination sometimes led him, perhaps, into an untenable position, and carried him beyond what is written. Having formed an opinion he clung to it tenaciously, almost to the point of being unyielding and even combative".²¹ So then as we have already seen in "Omphalos" Gosse did not always seem to appreciate the distinction between what was patently biblical and that which was merely speculative. This fault is most clearly seen in his attitude to prophecy. He held to the historical premillennialist school of prophecy, and he became utterly convinced that the second coming would occur first in 1866, and then again in 1877. At the beginning of 1866 he wrote a pamphlet entitled "6,000 Years of the World's History Now Closing", in which he confidently asserted that "1866 is the very year, the annus mirabilis".²²

The increasing introversion and isolation of the 60's and 70's was something which Gosse himself seemed to cultivate. His understanding of the doctrine of

separation meant that he felt he should keep apart from those who did not share his Biblical interpretations, and he once stated that "I have held myself aloof from companionship with men of science."²³ He was utterly self-contained, and often exclaimed that "my mind to me a kingdom is". Edmund Gosse's assessment may be a little exaggerated, but there is obviously some truth in it: "man was the animal that he understood less than any other, understood most imperfectly, and, on the whole was least interested in. He would cheerfully have given a wilderness of strangers for a new rotifer".²⁴ The classic example of this lack of humanity is the famous entry in Gosse's diary on the day of Edmund's birth. "E. delivered of a son. Received green swallow from Jamacica."²⁵

Gosse also made some sad mistakes in bringing up his son Edmund. For example he fed Edmund (then 8 years old) with meaty expositions from the book of Hebrews. As Edmund put it "He sought to build spires and battlements without having been at pains to settle a foundation beneath them."²⁶ Another example was his insistence that whenever Edmund was unwell, this was a sure sign of the Lord's displeasure over some unconfessed sin.

So then let us learn from Gosse's mistakes. As we construct models concerning origins, let us not only seek to be true to scripture but also be quick to acknowledge where we are being speculative. New knowledge tomorrow may make our current models inadequate in certain respects, and if we teach them dogmatically to our children, we could find ourselves fostering unnecessary rebellion. Let us also seek to value human beings, created uniquely in the image of God, above any other aspect of His creation.

.....

We have already noticed some of Gosse's virtues, but I would like to conclude by emphasising that in all his work as a naturalist Gosse never failed to give God the glory. In "Rambles on the Devonshire Coast" he complained about modern zoologists who personified Nature, and citing Psalm 50:23 ("whoso offereth praise glorifieth me"), he declared that there was no virtue in concealing God's name when speaking of his wondrous works, "and in giving the honour of their formation to a fabulous and imaginary power."²⁷ The 'packaging' of the vast majority of books on natural history is that of evolutionary theory, the 'packaging' of Gosse's natural history books was unashamedly Christian. His books are liberally scattered with references which point to the Creator or to aspects of the Christian life, not in a forced unnatural way, but as the normal outflow of a mind constantly informed and directed by the Word of God. I shall give two concluding examples of this attitude to the study of living things which is one which we should all surely seek to emulate.

When describing one particular type of seaweed that is colourless out of the water, but glorious in the sea he comments that it may be compared to some Christians, “who are dull and profitless in prosperity but whose graces shine out gloriously when they are plunged into the deep floods of affliction.”²⁸

Then again as he refers to his work in the rock pools he asks the question “Shall we say that they are mean creatures, beneath our regard? Surely no: God does not despise them. The forecasting of their being occupied His eternal mind “before the mountains were brought forth,” and the exquisite tints with which they are adorned are the pencillings of His almighty hand. Yes, O Lord, the lowly tribes that tenant these dark pools are like the heavens themselves “the work of Thy fingers,” and do as truly as those glowing orbs above us “declare Thy glory” and “show Thy handiwork”. If then they are worthy to be created and sustained by Thee, they are not unworthy to be examined by us with reverential regard.”²⁹

Francis Schaeffer has written that the Christian artist conveys the truth meaningfully by reflecting both the minor theme (the fall, man’s sin etc.) and the major theme (the goodness of God, salvation etc.). Perhaps we should note the fact that Gosse was at his best, not when He was arguing anti-evolution, but when he was arguing pro-creation. It will be necessary in this journal to expose the fallacies of evolutionary theory (the minor theme), but let us endeavour to ensure that the major theme of God’s glory and goodness in creation predominates.

References

1. D.L. Wertheimer “P.H. Gosse: Science and Revelation in the Crucible.” Unpublished Ph.D. Thesis. Toronto University 1977
2. Edmund Gosse “Life of Philip Henry Gosse” (1980) p. 70
3. Ibid p. 169
4. E. Gosse “Father and Son” p. 53
5. E. Gosse “P.H. Gosse” p. 329
6. Ibid p. 367
7. Ibid p. 337
8. E. Gosse “Father and Son”
9. Wertheimer p. 181
10. “Rotifera or Wheel Animalcules” Hudson & Gosse (1886) p. 17
11. A.C. Jenkins “The Naturalists, Pioneers of Natural History” published by Hamish Hamilton p. 5
12. E. Gosse “Father and Son” p. 98
13. E. Gosse “P.H. Gosse” p. 348

14. E. Gosse "Father and Son" p. 97
15. E. Gosse "P.H. Gosse" p. 256
16. Wertheimer p. 264
17. E. Gosse "P.H. Gosse" p. 281
18. P.H. Gosse "Omphalos" p. 27
19. Wertheimer p. 306
20. Ibid p. 332
21. E. Gosse "P.H. Gosse" p. 369
22. Wertheimer p. 350
23. Ibid p. 306
24. E. Gosse "P.H. Gosse" p. 350
25. E. Gosse "Father and Son" p.10
26. Ibid p. 65
27. P.H. Gosse "Rambles on the Devonshire Coast" (London 1853) p. 249
28. P.H. Gosse "The Aquarium" (1856) p. 93
29. P.H. Gosse "Rambles" p. 19

THINKING AGAIN ABOUT ADAM

by Bruce F. Baker

Many people lump Adam together with Father Christmas and St. George — a nice idea but only loosely connected with facts. Such people would probably be surprised at anyone caring very much about the details of events that happened so long ago in man's history. Who can possibly know? And does it matter anyway? The answer to the second question is that *truth always matters*. The answer to the first is that the *Bible claims to have God's word on the subject*. This article will seek to present the biblical teaching concerning Adam. *

1. ADAM WAS AN HISTORIAL PERSON

The clear contention of the Bible is that Adam was a real person and not a fictional hero. This was assumed by Job when he said, "If I have concealed my sin as *Adam did* by hiding my guilt in my heart . . ." (Job 31) and by Hosea when he accused the Israelites: "like Adam they have broken the covenant" (Hosea 6). In the New Testament the same assurance is found that he and Eve existed. "Adam was not the one deceived; it was the woman who was deceived by the serpent's cunning" (2 Corinthians 11). Again, when the Bible divides up history it speaks of "the time of Adam to the time of Moses" (Romans 5) for both figures are rooted in time and space. Luke and Jude, quite as much as Genesis, trace the source of their genealogies of real people back to the real man Adam.

2. ADAM WAS THE ORIGINAL PERSON

Adam and his partner are not pictured in the Bible as one couple among a species that had "made it" by evolution, as some would like to think; nor as one of the so-called "neolithic" farmers.¹ The Adam of the Bible was the first human being and had no contemporaries who shared his qualities. From this first couple every human being who has ever lived, or ever will live, is descended. "Eve is the mother of all living" is how Genesis 3 puts it, and the same point is made by Paul: "God made the world and everything in it *from one man he made every nation of men*" (Acts 17). Luke's genealogy of Jesus takes as its start not a primitive group but a single man — Adam. And, if we go back before that? — "Adam the son of God" is Luke's expression. Go back beyond Adam and you reach God who was in existence before creation. When the Bible, therefore, speaks of the unity of the human race, it does not mean some vague notion of "spiritual unity" but a real physical unity that is derived from our common descent from "*the first man Adam*" (1 Corinthians 15).

3. ADAM WAS A **CREATED** PERSON

Genesis chapters 1-3 not only describe the first man, but also tell how that first man came into existence. Was it, as some picture it, that the body of an ape was given a soul? Had “the creature into which God breathed human life . . . been a species prepared in every way for humanity, with already a long history of practical intelligence, artistic sensibility and the capacity for awe and reflection”²? The creation the Bible speaks of is not the *humanising* of a subhuman species but the *creation* of a man from the “dust of the earth” (Genesis 2, 3 and 1 Corinthians 15). Adam became man at the moment when his life began. He was not made an ape and later adapted so as to become a man. Jesus said, assuming that no-one would argue against the authority of Scripture; “Haven’t you read that at the beginning the Creator made them ‘male and female?’” (Matthew 19).

4. ADAM WAS A **REPRESENTATIVE** PERSON

Adam was chosen by God to *represent* all his descendants. That is why, according to Romans 5, when *he* sinned we were *all* counted as having sinned — “all sinned” is the stark phrase. Hence, even though people may not commit a wilful transgression of a known law, (e.g. an unborn baby or those who lived before the law was given through Moses) nevertheless all die, for all are counted as guilty. God bases the condemnation of all men on the real act of the first created man to whom we are all related. If Adam is a myth, then God’s condemnation of all men is based on a myth. If Adam is not the first man and our representative but just one of many who lived in those days, then God’s condemnation is an injustice.

“But is it fair that Adam’s failure should be counted as mine when I did not choose him to represent me?”, you may ask. Let us remember the comparison that is made in Romans 5. It tells of the only other representative for men that God has ever chosen — Jesus. We are told that just as what Adam did explains why all those whom he represents (i.e. the whole human race) are counted as ‘wrong’ and liable to death, so what Jesus did explains why all those whom *He* represents (i.e. all believers) are counted as ‘right’ and heirs of life. The facts of life therefore are that just as God bases our condemnation on the historical acts of Adam, so he bases every believer’s justification on the historical acts of Jesus, the “last Adam” (1 Corinthians 15). Before we put scissors to those parts of the Bible that assert that Adam was an historical, created, person, we should look to the other side of the page and see what we are removing concerning God’s method of dealing with men and his way of rescuing them in Jesus Christ.

WHAT ABOUT ADAM'S AGE?

Adam, like others of that early period, is said to have lived into his 900's. Simply because this is far beyond our present life-expectancy there is no need to dismiss it out of hand. We must remember that the environment then was very different from our own. As one writer says,

"the congenial climate . . . the pristine purity of the human genetic system . . . the absence of disease-producing organisms (and if there was a water vapour canopy as some interpret Genesis 1:7) the hyperbaric pressures . . . and the radiation-filtering effect of the canopy . . . such high pressures and the absence of mutation-producing radiations contribute significantly to longevity".³

WHAT ABOUT ADAM'S WIFE?

It is recorded that Adam could find no suitable partner. He examined all the other animals, but could find no kinship with them. If he had recently evolved from them, his body would still be essentially an ape's body. "It seems strange that he could have found nothing in common with either parents or siblings."⁴

The account of the formation of Eve from the side of Adam's body in Genesis 2 leaves little room either for the development of pre-adamite hominids into *Homo sapiens* of the male and female sexes, yet the Spirit-inspired writers of the New Testament insist of the accuracy of the Genesis account. "Adam was formed then Eve." (1 Timothy 2) "Man did not come from woman but woman from man; neither was man created from woman but woman from man."

WHAT ABOUT ADAM'S CHILDREN?

It is almost standard question for sceptics of the Bible to ask "Whom did Adam's son Cain marry?" In that we are told that "Adam had other sons and daughters" (Genesis 5:4) it does not seem unreasonable to suggest that he married one of his sisters. If someone objects that such marriages would be genetically harmful and biblically forbidden we must remember that since there would be virtually no mutant genes in their genetic systems there would not be any genetic harm done and that only by the time of Moses, when such mutations had accumulated, were such close marriages prohibited by God.⁵

WHAT ABOUT ADAM'S ABILITIES?

With the incessant presentation of our early ancestors as “ape-men” and “primitive” men of crude intelligence, behaviour and culture, we are inclined to assume that Adam was, if historical, certainly inferior to ourselves. Such an idea should be seriously questioned. Much talk of primitive culture is either misleading, as the continued research into megaliths, cave-paintings, and so on, shows, or is based on the study of cultures that have degenerated from an originally superior form. In view of the speed at which Adam and his descendants introduced crops, livestock rearing, musical instruments, metal-working and alloys, according to Scripture, there is little doubt that he was a man of great ability and culture.

Is our thinking about Adam conformed to the ideas of men or the revelation of God?

* Consideration of the so-called “early hominids” or “ape-men” is beyond the scope of this article. See “Thinking again about Ape-men”.

1. E.V. Pearce, *Who was Adam* (Paternoster) and R.J. Berry *Adam and the Ape* (Falcon) are attempts to Christians to impose this anthropologist's view of things on Scripture.
2. F.D. Kidner, *Genesis* (I.V.P.) p. 28, believes that there is no reason why this should not have been so.
3. H. Morris, *The Genesis Record* (Evangelical Press) p. 143.
4. *Ibid*, p. 98
5. It will be recalled that even in Abraham's day nothing was thought of his marrying his half-sister.

**CREATIONISM DEFENDED:
A CREATIONIST RESPONSE TO MICHAEL RUSE**

A Review Article of "Darwinism Defended:
A Guide to the Evolution Controversies"
by Michael Ruse (1982), Addison Wesley

Christoph Bluth

For many years creationists have been told 'creationism is not science, and probably never will be', but until now evolutionists have not bothered to respond to the scientific arguments presented by creationists. It is for this reason that Michael Ruse's book 'Darwinism Defended' is of great interest, since, in his own words, it "is intended to be a refutation of the Creationist position" (p. 303).

Michael Ruse's method of attack is to first give a presentation of 'orthodox' evolutionary theory, which for him is 'Neo-Darwinism', then to dispose of some challenges to the 'orthodox' interpretation — e.g. the view that the principle of natural selection is a tautology, and the theory of 'punctuated equilibria' as an alternative to the gradualist interpretation of the fossil record. The final part of the book is a direct confrontation with creationism.

Naturally, in the space presently available, it is not possible to deal with all of Ruse's arguments, and hence I wish to confine myself to a brief review of a few of the most important topics covered in the book.

Most central to Ruse's concern and obviously to any discussion about evolution is the mechanism of evolution. In this area Ruse reveals himself as a staunch defender of the Darwinian principle of random variation and natural selection as the ultimate cause of all evolutionary change, over and against those in modern biology who believe that the recent developments in molecular biology, systematics and paleontology paint a somewhat different picture — not to mention the creationists, who of course deny the possibility of evolution altogether.

A great deal of time is spent on explaining the fundamentals of population genetics, the meaning of genetic variation and natural selection. Ruse may be surprised about the extent to which creationists will agree with his exposition; creationists have no quarrel with the existence of genetic variation, with the laws of Mendel or Hardy and Weinberg. The point at which Ruse's exposition turns weak is when we get around to asking the question to what extent the existence of microevolution can help us with understanding the mechanism of macroevolution.

For Michael Ruse, the answer is clear; macroevolution is nothing more than scaled-up microevolution. Population genetics is both necessary and sufficient to explain all known aspects of evolution.

Nothing that Michael Ruse says in his book comes anywhere near a proof of this contention. That all is not as simple as it might appear becomes clear in R.C. Lewontin's study, where he freely admits, "It is an irony of evolutionary genetics that, although it is a fusion of Mendelism and Darwinism, it has made no direct contribution to what Darwin obviously saw as the fundamental problem: the origin of species. . . . *we know virtually nothing about the genetic changes that occur in species formation.*" (Lewontin 1974, p. 159) The evolutionary concept postulates that all living beings on this planet have ultimately a common biological origin, and that complex organisms have gradually evolved from more primitive ones. This contention does not logically follow from microevolution as described by population genetics.

Obviously Ruse argues that random mutations provide a sufficient source of new genetic variation for macroevolution to occur. He doesn't think it necessary to provide a quantitative basis for this hypothesis. The reason is obvious: Any quantitative calculation that has been done to see if random mutations could generate enough new biological information for evolution to occur has been overwhelmingly against this hypothesis (Moorhead & Kaplan 1967; Grassé 1973; Coppedge 1973). M.P. Schützenberger from MIT concludes his quantitative study of evolution models by saying: "Thus . . . we believe there is a considerable gap in the neo-Darwinian theory of evolution, and *we believe this gap to be of such a nature that it cannot be bridged within the current conception of biology.*" (Schützenberger in Moorhead & Kaplan, 1967).

Ruse hopes to bridge this gap by the action of selection on random variation: "Natural selection allows the successes, but 'rubs out' the failures. Thus, selection creates complex order, without the need for a designing mind. All of the fancy arguments about a number of improbabilities, having to be swallowed at one gulp, are irrelevant. Selection makes the improbable, actual." (p. 308)

Unfortunately for Ruse, however, the calculations cited *include* the operation of selection. Thus "now we have less excuse for explaining away difficulties by invoking the unobservable effect of astronomical numbers of small variations" (Schützenberger).

Hence macroevolution does not follow even if we accept Ruse's views on microevolution. But it is by no means certain that those are true, either.

The amount of hidden variation is the most central problem of population genetics, and two principal predictions have been made. One is called the *classical theory*, defended by H.J. Muller, M. Kimura, T.H. Jukes and others. It assumes (in a simplified version) that at nearly every locus every individual is homozygous for a 'wild-type' gene; heterozygosity is rare; mutations are mostly deleterious and natural selection acts as a 'cleansing agent' to free the population from genetic defects. The *balance theory* pioneered by T. Dobzhansky and defended by F.J. Ayala and others maintains the opposite: nearly at every locus every individual is heterozygous. Hence it must be assumed that some sort of 'balancing selection' is in operation that maintains the alternate alleles in the population. (Both hypotheses have of course been considerably refined; see Lewontin, 1974; Ouweeneel, 1977). The two hypotheses make different predictions about the amount of variation in a population; under the balance hypothesis, there is a great deal of variation in the population, to such an extent that one cannot really speak of a 'wild type' at all; the classical theory, in its most extreme form, predicts that there is very little variation within a population, and according to Lewontin the evolutionary program would be quite hopeless if the classical theory were true.

Naturally, Ruse supports the balance theory. But unfortunately, it is not really known whether or not the balance theory is true. Lewontin cites very strong reasons to reject both the balance and the neo-classical theory (Lewontin, 1974). One can almost sense his frustration as he writes, in view of this dilemma: "How can such a rich theoretical structure as population genetics fail so completely to cope with the body of fact?" (Lewontin, 1974, p. 267)

For Ruse, the balance theory is a good stick to beat creationists with: "Most particularly, the Creationists fail through ignorance of the incredibly significant implications of the balance hypothesis. A group of organisms is not sitting around, waiting for a good new mutation to occur as the need arises, which mutation will then be cherished by selection. Rather, all the time, there is massive variation within populations, waiting to be drawn upon, as the need arises Thus selection can create new features, because there is a veritable bank or library of mutations, to draw on." (p. 307 f.)

Although there are some examples which support this statement, as an explanation for the origin of species it is almost certainly false.

While it is true that there is a great deal of genetic variation in populations, on the other hand it can be demonstrated with many examples that the amount of variation present is very clearly limited.

In 1800, experiments were conducted in France to increase the amount of sugar in table beets (at the time around 6%). Artificial selection was conducted on a large scale, selecting the sweetest to produce seed for the next crop. By 1878 the average sugar content of the table beets had risen to 17%. However, further selection failed to increase the sugar content from thereon, the limits of genetic variation had been reached.

A similar example is the reduction in the number of bristles on the thorax of fruit flies by artificial selection and breeding. In each generation, the number was reduced, until the 20th generation, after which the number remained the same. The limit of variation by artificial selection had been reached, and any experiment involving cross-breeding and artificial selection, even if it proves the existence of great genetic variations, always demonstrates the limits of the potential for variation fairly soon.

In the opinion of the well-known zoologist Pierre Grassé, the limits of variation established by artificial selection are in profound contradiction to the Neo-Darwinian argument. (Grassé, 1973) For 10,000 years, the dog has been subjected to artificial selection, revealing a great amount of variation, but not allowing the emergence of a new species. The genetic potential is limited. Grassé applies a similar argument to other domesticated animals (cows, bred for 4000 years; chickens, bred for 4000 years; sheep, bred for 6000 years).

Grasse furthermore argues that artificial selection produces a much greater variety than natural selection. As an example he compares the dog and the jackal which he considers to be closely related. The dog (*Canis familiaris*) and the jackal (*Canis aureus*) are genetically related (in the evolutionary model) and are subject, with some minor differences, to the same kind of mutations. The jackal, however, appears to be very stable genetically, whereas the dog species is divided into numerous races and sub-races. Grassé concludes that this is due to the fact that the dog has been subject to artificial selection, whereas the jackal has only been subject to natural selection. The action of natural selection may differ from the way postulated by the Neo-Darwinian view.

For example, it is not at all clear to what extent the evolution of enzymes and other molecules is due to natural selection and to what extent it is the result of the chance accumulation of mutations. Lewontin explains "it has proved remarkably difficult to get compelling evidence for changes in enzymes brought about by selection, not to speak of evidence for adaptive changes..." (Lewontin, 1978)

Quite compatible with Grassé's view, but incompatible with Ruse's understanding of the action of natural selection is the Red Queen hypothesis formulated by Leigh Van Valen. It postulates essentially that the environment is constantly decaying with respect to existing organisms. The function of natural selection then is to enable the organisms to maintain their state of adaption, rather than, as Neo-Darwinism would have it, to improve it. Leigh Van Valen obtained evidence for his hypothesis from paleontological data. He plotted the extinction rates of two classes of marine invertebrates and compared them with the duration of survival of living types. The curves compared very well with the predictions of the Red Queen hypothesis, and contradicted the model that natural selection improves the states of adaption of the organisms (see Lewontin, 1978).

This brings us to the subject of paleontology. The dilemma of modern paleontology is described very succinctly and honestly by Stephen Jay Gould: 'The history of most fossil species includes two features inconsistent with gradualism: 1. *Stasis*. Most species exhibit no directional change during their tenure on earth. They appear in the fossil record much the same as when they disappear; morphological change is usually limited and directionless. 2. *Sudden Appearance*. In any local area, a species does not arise gradually by the steady transformation of its ancestors; it appears all at one and "fully formed". (Gould, 1977)

Simpson already explained that 'there is in this respect a tendency toward systematic deficiency in the record of the history of life. It is thus possible to claim that such transitions are not recorded because they did not exist, that the changes were not by transition but by sudden leaps in evolution.' (Simpson, 1949)

To explain the lack of evidence of gradual transitions in the fossil record, Niles Eldredge and Stephen J. Gould formulated the theory of 'punctuated equilibria'. The main tenets of this theory could be briefly summarised as follows: (1) Intermediate forms exist only in small populations, which are less likely to leave a trace in the fossil record than large ones. (2) Speciation occurs rapidly in small isolated populations, followed by long periods of stasis. (3) Intermediate forms did not exist in the same place as their ancestors and were hence not likely to be preserved alongside them. (Eldredge and Gould, 1972; Ridley, 1980)

Instead of gradual evolution change, this theory predicts periods of long stasis interrupted by sudden bursts of rapid evolution — hence punctuated equilibria.

Ruse goes to great lengths to demonstrate that the theory of 'punctuated equilibria' is in conflict with orthodox Darwinian theory, and then, as defender of this orthodoxy, proceeds to attack this new threat.

The attack on the Eldredge/Gould model proceeds along two lines: (1) 'Gradualists' try to demonstrate that gradual transitions actually do occur in the fossil record.

(2) Critics of the 'punctuated equilibria' approach attempt to show that the mechanism of evolution implied by this theory is implausible.

Considering the fossil evidence certainly makes Ruse somewhat uncomfortable. Nonetheless he argues: "Although it is conceded that there are many gaps in the fossil record, it is countered, nevertheless, that there is a sizeable number of well-established gradual changes to be found in the record. Hence, given all the factors making fossilization improbable, Darwinism remains totally plausible." (p.218)

To use one of his own metaphors, he is "putting on a little bit of a brave face" considering that it becomes apparent from his own words that the "well-established gradual changes" which he quotes are actually quite vigorously disputed. One frequently cited example is the alleged progressive uncoiling of ammonites during the cretaceous. This was supposedly the final phase in the evolution of ammonites where they began to change their form and structure. As is well-known, ammonites became extinct at the end of the cretaceous period. However, next to the 'heteromorphous' species we also find those with normal shells. The latest explanation postulates that in what could almost be called 'reverse evolution' coiled shells re-appeared. Uncoiled ammonites are not only known from the cretaceous, but can also be found in the Jurassic and Triassic formations. The whole gradualistic explanation collapses (Scheven, 1979). The ammonites are a particularly rich field of disputable gradualistic interpretation. Another example concerns the development of lobe formations. What started as a wavy suture line at the point where the chambers were separated, progressively changed into a zig-zig line and finally into a complicated pattern. Scheven, however, has demonstrated that "in contradiction to this rule, the Permian genera *Cyclolobus* and *Perrinitis* exhibit the complicated lobe formation, just like the Triassic genera *Ptychites*, *Sturia*, *Pinacoceras* and *Rhacophylites*, while *Neolobites* — one of the latest ammonite genera in the Upper Cretaceous — exhibits the most primitive suture lines, and the Cretaceous genera *Engonoceras*, *Tissotia*, *Platylenticeras* and *Buchiceras* exhibit the lobe lines of the Triassic *Ceratites*, also an 'early' stage in the evolutionary sequence." (Scheven 1979, p.88) Thus Scheven has disproved one of the most impressive examples of progressive evolution in the fossil record. The recent conclusions by Gingerich who vigorously defends gradualism have also been disputed (Gould and Eldredge, 1977; West 1979; Ridley 1980; Paul 1980).

For Ruse, one the best 'intermediary' forms that has been preserved and which he uses to buttress his case against 'punctuated equilibria' is *Archaeopteryx*, 'firmly intermediate between reptiles and birds' (p.220). He castigates Stephen Jay Gould and the Creationists alike for not taking it seriously.

Unfortunately for Ruse, the days of *Archaeopteryx* as a 'missing link' are coming to an end. In a series of studies, L.D. Martin and his co-workers have demonstrated the similarity between *Archaeopteryx* and other Mesozoic birds, and have also compared them to various groups of reptiles. It appears that the pioneering studies by J.H. Ostrom on which the current interpretation of *Archaeopteryx* is based, were mistaken in certain crucial points. "We think that many of these "coelurosaurian" features are incorrectly identified. This is certainly true of the tarsal region, where *Archaeopteryx* has a pretibial bone, fibula and calcaneum of the avian type. In the dentition, *Archaeopteryx* has unserrated teeth with constricted bases and expanded roots like those of other Mesozoic birds." (Martin, Stewart and Whetstone, 1980). If the phylogeny of birds is as far removed from the currently accepted model as Martin and co-workers claim, then *Archaeopteryx*'s status as missing link goes by the board. (Martin and Tate 1976; Martin and Bonner 1977; Martin and Stewart 1977; Whetstone and Martin 1979).

Paleontologist Chris Paul sums up the view supported by quite a few scientists: "... the vast majority of cases ... are sudden ... In my view the fossil record accords well with the Eldredge and Gould model. The rare cases which can be found to support Gingerich's point of view may well represent instances where the peripheral isolated populations have been preserved during their critical state of change". (Paul 1980)

Creationists, of course, would go much further than that. The gap in the fossil record is far too persistent for the Eldredge/Gould model to be adequate. Consider the "Cambrian explosion", i.e. the sudden appearance of a great diversity of life forms in the Cambrian without signs of many precursors, when "the entire system of life arose during about 10 percent of its history surrounding the Cambrian explosion some 600 million years ago." (Gould 1980) Gould successfully demolishes one attempt after the other to explain this phenomenon. However, that the model of punctuated equilibria should successfully account for the Cambrian explosion also stretches credulity to its limits. Paleontologist Chris Paul, by no means a creationist, admits that "the Edlredge and Gould model helps to explain the sudden appearance of fossil species, but it is inadequate to explain the simultaneous appearance of many forms of life ... or, for that matter, the sudden disappearance of many unrelated species. (Paul 1980, p. 215) Thus the new theory fails precisely at the points where it counts most.

The second criticism of 'punctuated equilibria' by 'gradualists' concerns their model of speciation. Anderson and Evensen (1978) have done a study on the sizes of the geographic ranges of species of North American terrestrial vertebrates which are considered to have diverged recently. Mark Ridley comments, "Although uncertainty exists about just how recently the pairs of species diverged and about the relation between range and population size, Anderson and Evenson's data does not support Eldredge and Gould's claim that speciating populations are very small." (Ridley 1980). John Maynard Smith (1976) has argued that the total rates of mutation are lower in smaller populations, and that this may lead to lower rates of evolution.

Naturally, the creationist arguments against the Neo-Darwinian mechanism of evolution apply with a vengeance to the theory of 'punctuated equilibria'. If quantitative calculations make gradual evolution appear inconceivable, rapid evolution is quite impossible.

Eldredge and Gould are aware of this problem and realize that they must find mechanisms of speciation that go beyond the Neo-Darwinian paradigm. A change in a chromosome (e.g. a translocation or an inversion) within one local population is suggested as a mechanism for rapid speciation. Mark Ridley comments: "... even given a correlation between chromosome differences and speciation, it is not obvious which is cause and which effect, and nor can we be sure that chromosomal speciation would necessarily produce punctuated evolution," (Ridley 1980). Ruse is quite scathing: "Again, if one looks at some of the proposed chromosome species mechanisms that so excite Gould, one suspects that orthodox evolutionists would like more proof as to their universal nature." (p. 218) More recently, Gould has proposed large mutations as the main cause of punctuated equilibria, obviously a counsel of despair in the absence of a plausible mechanism.

The main problem would seem to be that some of the gaps in the fossil record which the theory of 'punctuated equilibria' is supposed to explain are of such a nature that none of the accepted mechanisms of evolution, including the ones proposed by Eldredge, Gould and Stanley, are sufficient to account for rapid evolution on such a scale.

We are hence faced with a remarkable paradox: The paleontological evidence overwhelmingly favours the interpretation of 'punctuated equilibria' over against the 'gradualist' model, whereas the evidence from population genetics overwhelmingly favours, *if any*, the gradualist model.

For creationists, the answer is clear: Neither model accounts for the fossil record. Only the creation model will do.

Ruse, of course, does not leave us in doubt about his views on creationism: "I believe Creationism is wrong: totally, utterly and absolutely wrong." (p.303)

This statement does not become true just by repeating it again and again, which is what evolutionists have confined themselves to doing until recently. Ruse devotes the final part of his book to his critique of creationism. Let me briefly touch on some of the main arguments.

Creationists have often argued that the 2nd law of thermodynamics is in contradiction to the concept of evolution. Ruse attacks this argument on the basis that the law only applies to isolated systems. If one reads the technical literature on this subject, e.g. by Prigogine, Nicolis and Eigen, one realizes that it is not as simple as Ruse would have us believe. Prigogine is very well aware of the problems the 2nd law causes for evolution; hence his valiant efforts over many decades to find a way to overcome them. Creationists have, of course, dealt quite effectively with Ruse's objection (see Williams, 1981; Wilder-Smith, 1970). Of course thermodynamics does apply also in a non-isolated system (albeit in a somewhat different form). It is difficult to believe that random forces acting on a system like the pre-biological earth-sun system can produce order. The longer a system is subject to random forces, the more random the distribution of molecules is likely to become. Over time, the system is considerably more likely to approach equilibrium rather than to consistently depart from it. What Ruse would have to show is that the energy influx from the sun causes the earth in its pre-biotic stage to systematically deviate from equilibrium, and that he cannot do (Williams, 1981; Gish 1972).

I have written a survey of the various evolutionary self-organization models in thermodynamics advanced in recent times (Bluth, 1978). Hence I am reasonably familiar with the literature in this area. While Ilya Prigogine, Manfred Eigen and others have obtained interesting and useful results, I am not convinced yet that the thermodynamics problem of evolution has been solved or will be solved in the foreseeable future. Creationists argue that the self-organization of matter seems to be against the laws of nature as we know them.

Ruse does not seem to quite understand the second argument from thermodynamics as applied to evolution, which considers the correspondence between entropy in statistical mechanics and information theory. The argument is that the coded order which is present in DNA is not a property of matter itself; it is information given by the arrangement of nucleotides which is not contained in the physico-chemical properties of DNA *per se*. Creationists have argued that the information content of such codes cannot have developed from random processes or 'noise'. Ruse seems to be unaware (p. 307) that an analogue to the 2nd law of thermodynamics exists in information theory (Andrews 1979; Coppedge, 1973; Wilder-Smith, 1970; Yockey 1979).

Ruse does not seem to quite understand the second argument from thermodynamics as applied to evolution, which considers the correspondence between entropy in statistical mechanics and information theory. The argument is that the coded order which is present in DNA is not a property of matter itself; it is information given by the arrangement of nucleotides which is not contained in the physico-chemical properties of DNA *per se*. Creationists have argued that the information content of such codes cannot have developed from random processes or 'noise'. Ruse seems to be unaware (p. 307) that an analogue to the 2nd law of thermodynamics exists in information theory (Andrews 1979; Coppedge, 1973; Wilder-Smith, 1970; Yockey 1979).

It is becoming more obvious that Ruse is clearly unaware of a great deal of creationist literature. The next issue dealt with concerns the origin of life: 'We know full well that work on this problem has far to go. But, present progress surely merits detailed treatment, not a back-of-the-hand dismissal. Take the Creationists' claim that Stanley Miller's synthesis of amino acids proves nothing, since amino acids are not living things. Whoever said they were? Miller himself certainly never did want to claim that amino acids are living things. The point is that their synthesis does seem to be an important stage in the natural production of life, and can rightly be respected as such. Take also the Creationists' flat claim that the amino acids would not have survived — "protection would not have been available on the primitive earth." At the very least, this claim needs justification. "Simply stating your position is no argument." (p. 307)

It appears that Ruse is entirely ignorant of the detailed analyses of modern theories of chemical evolution given by, for example, D.T. Gish (1972 and 1979) and A.E. Wilder-Smith (1970 and 1980). The argument that the amino acids formed by a Miller-type synthesis under primitive earth conditions could not have accumulated in great concentrations because their rate of destruction would be of the same order as their rate of production has been well-supported by empirical calculations (Gish 1972). Obviously Ruse hasn't bothered to read technical papers by creationists on this issue.

It is not very difficult to show that Michael Ruse is really quite extraordinarily ignorant of creationism. For example, he says, "it would be nice to see the Creationist take on the question of the horse, which is one of the best documented cases of evolutionary change." (p.311) Ironically, the horse is discussed in one of the books that Ruse cites (Gish, 1979b). In this case apparently Ruse didn't get further than the advertising blurb (p.298) Of course, more thorough treatments of the phylogeny of the horse from a creationist standpoint are available, see for example Cousins (1971) and Scheven (1979).

Biblical Creation 4:13

About the Galapagos finches Ruse writes: “They are nowhere to be found in the Creationist discussion!” (p.309) Obviously, Ruse hasn’t spent much time looking, because a number of creationist discussions on this topic exist (Lammerts 1970; Scheven 1979; Harper 1981).

Since Ruse would like to debate with creationists and win, he takes head-on the question of human footprints in Cretaceous formations in the Paluxy River bed, Glen Rose, Texas. The impression he gives is that they might be misinterpreted Dinosaur footprints. It is very clear to anyone who has actually seen the prints (and Ruse must have at least seen photographs of them in the books he cites) that some of the footprints must be human or forgeries. Analysis has shown that a good number of them appear to be genuine and are certainly not carvings (Scheven, 1979). They were not actually discovered by creationists, but rather by a very orthodox paleontologist by the name of R.T. Bird in 1939. Bird described his findings in his publications, but since they didn’t fit into his scheme of things, he declines to ascribe any particular interpretation to them. If Ruse had read Creationist literature thoroughly, he would also know that human footprints were discovered in Carboniferous rocks (Wilder-Smith 1968; Rusch 1971). If any of these findings are inadmissible or falsely interpreted, this would need to be established and argued rather more conclusively than Michael Ruse has done.

Just how misleading Ruse’s portrayal of creationism really is can be demonstrated with the example of radiometric dating techniques. He claims that “no proof is offered for the Creationist claim that processes of decay may have speeded up . . .” (p.317) The context makes it clear that he is saying that creationists are suggesting that rates of radioactive decay have not been constant, but have not made any attempt to give reasons for this.

Quite to the contrary: Creationists have specified both mechanism of the change in the rate of radioactive decay and *empirical evidence that this actually has occurred*. (Morris 1974; Slusher 1973) Ruse may disagree with these theories, but this comment that no attempt has been made to explain the changes in the rate of radioactive decay is plainly false. Furthermore, Ruse seemingly does not think it necessary to deal with examples of discrepancies in radiometric dating results cited in creationist literature. Since some of this material is covered in *Scientific Creationism* by H.M. Morris, which Ruse refers to frequently, one gains the impression that he has not even properly read the few creationist sources that he does quote.

Since Ruse’s book is “intended to be a refutation of the Creationist position” it is truly astonishing that among the approximately 290 books and papers cited in his bibliography there are merely six creationist titles! An analysis of Ruse’s refutation suggests that he has not read a single technical study by creationists on any of the major issues under discussion. The net effect is that to this day the arguments by creationists have remained unanswered.

Bibliography

- Anderson and Evenson (1978). *Syst. Zool.* 27, 421
- Andrews, E. (1979). 'Is Evolution Scientific?' in 'Life on Earth — evolved or created?' Conference Papers, Biblical Creation Society
- Bluth, C. (1978). *Thermodynamics of Evolution*, unpublished thesis submitted to Dublin University
- Coppedge, J. (1973). *Evolution: Possible or Impossible?*, Grand Rapids, Zondervan
- Cousins, F.W. (1971). 'A note on the Unsatisfactory Nature of the Horse Series of Fossils as Evidence for Evolution, *Creation Research Society Quarterly*, 8 (2) : 99-108
- Eigen, M. (1971). 'Self-Organization of Matter and the Evolution of Biological Macromolecules', *Naturwissenschaften* 58 : 465-522
- Eldredge, N. and S.J. Gould (1972). 'Punctuated equilibria: an alternative to phyletic gradualism' in Schopf, *Models in Paleobiology*, San Francisco, W.H. Freeman
- Gish D.T. (1972). *Speculations and Experiments Related to Theories on the Origin of Life*, San Diego, Institute for Creation Research
- Gish, D.T. (1979). *Creation Research Society Quarterly* 15 (4) : 185-203
- Gish, D.T. (1979b). *Evolution — the fossils say no*, San Diego, Creation-Life
- Gould, S.J. (1977). *Natural History*, 86, 22-30
- Gould, S.J. (1980). *Ever Since Darwin*, Harmondsworth, Penguin
- Gould, S.J. and N. Eldredge (1977). 'Punctuated equilibria: the tempo and mode of evolution reconsidered. *Paleobiology* 3, 115-151
- Grassé, P.P. (1973), *L'Evolution du vivant*, Paris, Albin Michel
- Harper, G.H. (1981). 'Speciation or irruption: The significance of the Darwin finches', *Creation Research Society Quarterly* 18 (3) 171-175
- Lammerts, W.E. (1970). 'The Galapagos Island Finches', in *Why Not Creation*, ed. by W.E. Lammerts, Grand Rapids, Baker Books
- Lewontin, R.C. (1974). *The Genetic Basis of Evolutionary Change*, New York, Columbia University Press
- Lewontin, R.C. (1978). *Scientific American*, 239 (3) : 156-169
- Martin, L.D. and J. Tate, Jr. (1976). 'The skeleton of *Baptornis advenus* from the Cretaceous of Kansas', *Smithsonian Contrib. Paleobiol.* 27 : 35-66
- Martin L.D. and O. Bonner (1977). 'An immature specimen of *Baptornis* from the Cretaceous of Kansas, *Auk* 94 : 787-789
- Martin, L.D. and J.D. Stewart (1977). 'Teeth in *Ichthyornis* (Class: Aves), *Science* 195: 1331-1332
- Martin, L.D., J.D. Stewart and K.N. Whetstone (1980). 'The Origin of Birds: Structure of the tarsus and teeth', *The Auk* 97: 86-93
- Maynard Smith, J. (1976). 'Evolution and the theory of games', *Amer.Sci.*, 64 : 41-45
- Moorhead, P.S. and M.M. Kaplan (eds.) (1967). *Mathematical Challenges to the Neo-Darwinian Interpretation of Evolution*, Philadelphia, Wistar Institute Press
- Morris, H.M. (1974). *Scientific Creationism*, San Diego, Creation-Life
- Nicolis, G. and Progogine, I. (1977). *Self-Organization in Non-Equilibrium Systems*, New York, J. Wiley

- Ouweneel, W.J. (1977). 'Genetics and Creation Studies', *Creation Research Society Quarterly*, 14 (1) : 26-34
- Paul, C.R.C. (1980). *The Natural History of Fossils*, London, Weidenfeld and Nicholson
- Ridley, M. (1980). 'Evolution and gaps in the fossil record', *Nature* 286 : 444-445
- Rusch, W.H. (1971). 'Human Footprints in Rocks', *Creation Research Society Quarterly* 7 (4) : 201-213
- Scheven, Joachim (1979). *Daten zur Evolutionstheorie im Biologie-unterricht*, Neuhausen-Stuttgart, Hänssler Verlag. (English translation to be published by Creation-Life, San Diego)
- Simpson, G.G. (1949). *The Meaning of Evolution*, New Haven, Yale University Press
- Slusher, H.S. (1973). *Critique of Radiometric Dating*, San Diego, Institute of Creation Research
- West (1979), *Paleobiology* 5, 252
- Whetstone, K.N. and L.D. Martin (1979). 'New look at the origin of birds and crocodiles', *Nature* 279: 234-236
- Wilder-Smith, A.E. (1968). *Man's Origin, Man's Destiny*. Wheaton, Illinois Harold-Shaw
- Wilder-Smith, A.E. (1970). *The Creation of Life*, Wheaton, Illinois, Harold-Shaw
- Wilder-Smith, A.E. (1980). *Die Naturwissenschaften kennen keine Evolution*, Basel, Schwabe
- Williams, E.L. (ed.) (1981). *Thermodynamics and the development of order*, Norcross, Georgia. Published by the Creation Research Soc.
- Yockey, H.P. (1977). 'A Calculation of the Probability of Spontaneous Biogenesis by Information Theory', *J. Theor.Biol.* 67, 377-398

BOOK REVIEW

The view from Planet Earth: Man looks at the Cosmos by Vincent Cronin,
Collins, London (1981) 348pp £12.50

Many Christians today are aware of the impact of scientific ideas about the universe on general culture and belief. Amongst Evangelicals, Dr. Francis Schaeffer has done more than any other figure to foster such awareness and to break down some of the artificial barriers between C.P. Snow's 'two cultures'. With its relevance to these same concerns, this volume is especially welcome. The author is the distinguished Renaissance historian and biographer of Napoleon who commands our respect by his elegant prose style and scholarly mastery of a broad canvas. The story of man's thoughts about the meaning of the cosmos is followed in essentially a chronological order. Beginning with the pre-Socratic Greeks, this is traced via Roman and mediaeval culture to the Renaissance. More than half of the book is devoted to the post-Newtonian era. This section comes right up to date with discussion of space exploration and the views of J. Monod and others. There are several points at which the author relates his theme explicitly to Christian belief. Firstly p46f contains a discussion of the cosmological concepts of Judaism as reflected in the Old Testament. Here many points of contrast with Greek 'science' are well made. However a greater stress on 'Hebrew Cosmology' as divine revelation would have been helpful. The Newtonian influence is thoroughly analysed including the temporary 'holy alliance' in England between Theology and Physics. The secularization of science via the rise of Deism is explained and there are important lessons in this discussion for the modern creationist movement. Nevertheless the author concludes his work with a significant chapter on 'Chance or Design?' which contains a telling apologetic for the recognition of design in the universe. All in all, this book is a delight to read with its flowing theme, enlivened by vivid pen-pictures of key figures, and its entertaining survey of science-fiction literature. The volume is illustrated by 20 plates and includes notes and references, a chronological table, an index and an appendix by Nigel Henbest on "The probability of Life: An Astronomer's View".

David Watts

Biblical Creation is published three times a year by the
Biblical Creation Society

President Prof. Edgar Andrews, *University of London*
Vice-Presidents Randal Macaulay, *L'Abri*
 The Revd Geoffrey Thomas, *Aberystwyth*
 Prof. Verna Wright, *University of Leeds*

More information about the Society may be obtained from the Secretary

Editorial matter should be addressed to Dr. D.C. Watts

Subscription enquiries should be addressed to the
Administrative Officer, Mr Nigel Halliday

Subscriptions

70p per issue, £2.00 per annum (students 50p, £1.00)
U.S. subscriptions (£4 surface, £5 air) to Dr. D. Lachman

"While *Biblical Creation* exists to further the aims of the *Biblical Creation Society*, opinions expressed in articles and signed editorials are not necessarily shared by either the Editorial Committee or the Society."

ISSN 0260-9460

Printed by Campsie Marketing